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EXAMINER

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2814

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

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Application Number: 09/856,139
Filing Date: May 29, 2001
Appellant(s): MARUYAMA ET AL.

GROUP 2800

Robert K. Carpenter
Reg. No. 34,794
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 4, 2005 appealing from the Office
action mailed August 4, 2004.

This is in response to the brief on appeal filed January 4, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

This appeal involves claims 67-77.

Claims 27-66 stand withdrawn from consideration as not directed to the elected invention.

Claims 1-26 have been canceled.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

5,997,598	Kobayashi et al.	12-1999
6,102,977	Johnson	08-2000
5,804,494	Mitani et al.	09-1998

Appellant Admitted Prior Art (AAPA).

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 67 and 69 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobayashi et al. (U.S. Patent No. 5,997,598).

Kobayashi teaches a clean room air conditioning facilities as claimed including:

an air conditioner having a boron-less filter and a boron adsorbing filter (ULPA filter), and one or more of wafer treatment apparatuses (local facilities) each having a boron-less filter (ULPA filter), wherein an atmosphere gas is recycled (return air) between the air conditioner, the

Art Unit: 2814

clean room and the wafer treatment apparatuses. (See Example 3, col. 14, line 55-col. 24, line 55).

With respect to term “boron-less filter”, this term is defined in the specification as – an air filter from which no boron is released. (Page 8, line 25 to page 9, line 2).

Since the filter of Kobayashi does not **release boron and the boron compounds are not present** in the local facilities (col. 1, ll. 48-59) and wherein at least one of the filter medium and the sealing material **does not release gaseous organic substances during use** (col. 2, ll. 35-42), the limitation of claim 67 is met.

With respect to claim 69, an Official Notice is taken regarding the internal pressure of a wafer treatment apparatus (local facilities) is adjusted to be higher than a clean room internal pressure and the clean room internal pressure is be higher than a clean adjusted to be higher than an external pressure (outside). This is known as “positive pressure” to prevent uncontrolled air from the clean room entering the wafer treatment apparatus as well as uncontrolled air from the outside entering the clean room.

In the Response to the Office Action mailed January 15, 2004, June 4, 2004 and also in this Brief, Appellant did not disagree with the Official Notice.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 68 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi '598 as applied to claim 67 above, and further in view of Johnson (U.S. Patent No. 6,102,977).

Kobayashi teaches a boron-less filter and boron absorbing filter for use in eliminating boron in the production of semiconductor.

Thus, Kobayashi is shown to teach all the features of the claim with the exception of explicitly disclosing such filter be placed in an outdoor air cleaner.

However, Johnson teaches that it is desirable to provide a make-up (outside) air handler that is not a potential source of boron contamination of the outside air. (See col. 2, lines 16-21).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to further place the boron-less filter and boron absorbing filter of Kobayashi in the outdoor (make-up) air cleaner as taught by Johnson to eliminate the potential source of boron into the clean room from the outside air.

3. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi '598 as applied to claim 67 above, and further in view of Applicant Admitted Prior Art (hereinafter AAPA).

Kobayashi teaches fabricating semiconductor wafer utilizing a clean room air conditioning facilities.

Art Unit: 2814

Thus, Kobayashi is shown to teach all the features of the claim with the exception of explicitly disclosing the amount of boron attaches on the surface of the wafer (or dopants concentration of the wafer).

However, AAPA teaches fabricating semiconductor device on a semiconductor wafer having attaches boron amount on the surface of the silicon wafer of 1×10^{10} atoms/cm². (See page 2, ll. 10-17).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to utilize the clean room of Kobayashi in the fabricating a semiconductor device on the wafer as taught by the AAPA because the clean room of Kobayashi would have avoid unnecessary doping of the wafer by eliminating dopant in the ambient, thus, the dopants concentration is fully controllable.

4. Claims 71-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi '598 as applied to claim 67 above, and further in view of Mitani et al. (U.S. Patent No. 5,804,494) and AAPA.

With respect to claims 71-73, Kobayashi teaches fabricating semiconductor wafer utilizing a clean room air conditioning facilities.

Thus, Kobayashi is shown to teach all the features of the claim with the exception of explicitly utilizing the wafer having boron concentration in the bulk silicon and a surface layer formed on the bulk silicon in the apparatus.

However, AAPA teaches fabricating semiconductor device including forming a surface layer (62) on a bulk silicon wafer (W). (See Figs. 10a-e, page 2, line 10-page 4, line 17).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to utilize the clean room of Kobayashi in the manufacturing process of wafer having the surface layer on the bulk silicon as taught by the AAPA because the clean room of Kobayashi would have avoid unnecessary addition of boron on the wafer surface by eliminating boron in the ambient.

Further, Mitani teaches a conventional silicon wafer having boron concentration in the range of 10^{15} atoms/cm³. (See third embodiment, Fig. 7, col. 5, lines 22-32).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to utilize the clean room of Kobayashi in the manufacturing process of AAPA having boron concentration in bulk silicon in the range of 10^{15} atoms/cm³ as taught by Mitani since boron have been eliminated form the ambient in the clean room, thus, boron contamination of the wafer surface is avoided.

With respect to the increment of boron concentration in the surface layer down to the depth of $0.5\mu\text{m}$, since the wafer (W) of the AAPA has been subjected to a thermal treatment following the formation of the surface layer, polysilicon (62), thus, boron from the surface of wafer (W) is known to diffuse toward the bulk silicon, thus, result in increment of boron concentration. (See page 2, ll. 10-16).

With respect to claims 74-77, a similar reasoning as that of claims 71-73 above is also applied here. Further, the silicon wafer (W) of the admitted art also includes a CVD silicon oxide film (64) provided on the polysilicon layer (62). (See Fig. 10c).

(10) Response to Argument

Regarding claims 67 and 69:

By highlight the term “**each having a boron-less filter**” Appellant appears to argue that Kobayashi does not teach such limitation.

First of all, Appellant has defined on record that “boron-less filter” means **an air filter from which no boron is released**. (page 8, line 25 to page 9, line 1).

Kobayashi clearly teaches: “a method of manufacturing a **filter medium**, a clean room and local facility such as semiconductor production apparatus in which gaseous organic substances are **not present**, as well as a clean room and local facility in which phosphorous compound and the boron compound are not present” (See col. 1, lines 47-59).

Thus, Kobayashi clearly anticipate the claim’s limitation “one or more wafer treatment apparatuses **each having boron-less filter**” since no boron compound are present in either local facility or the clean room itself.

Appellant asserts that the Kobayashi et al. patent makes clear that the boron content of the ULPA filter (“U.F”) material ranges from 15 to 52 µg/g.

However, the limitations of claim 67 clearly do not preclude any filter that contain boron, as long as from which no boron is released.

Therefore, the filter of Kobayashi clearly meet that limitation.

Appellant also adds: the filter of Examples No. 31 and No. 33, being the same as filter 32 and 34, respectively, then concludes: would also be expected to release boron.

Art Unit: 2814

Contrary to Appellant conclusion, the filters No. 31 and 32 are different from filters 33 and 34. In Table 6, there are two (2) type of filters being tested, Glass filter (1) and (3).

About the local facilities Nos. 31 and 33 of Kobayashi, Appellant reviews Kobayashi's patent and agrees that: since the organic phosphorus compounds and the boron **are not present in the local facilities**, such local facilities are particularly suitable as the local facility for use in semiconductor production. (Argument's page 8, lines 1-6).

Appellant uses the logic that if the filter of the local facilities Nos. 32 and 34 release a detectable amount of boron, thus, the filter of the local facilities Nos. 31 and 33 also release boron.

Appellant's logic is fundamentally flawed, because, the setting of the experiments are different.

Facilities Nos. 31 and 33 are the real setting of a fabrication facility: external (fresh) air passing a prefilter and return air from inside of the clean room were mixed and sent to a chamber at the back of the ceiling, and then passed through the ULPA filter. The mixing ratio is 10:1 (return air to fresh air). (See col. 13, line 65-col. 14, line 10).

The local facilities Nos. 32 and 34, on the other hand, use **only** fresh air, which is an extreme scenario. (See col. 15, lines 1-8). It is well known that fresh air contains a very high quantity of boron.

The most correct conclusion of Kobayashi should be: **direct flow of fresh air into a local facility should be avoided.**

Note that, two different type of filters, Glass fiber (1) (No. 31) and Glass fiber (3) (No. 33), if used in a normal fabrication setting would not release boron.

Appellant asserts: “appellants respectfully disagree that Kobayashi (‘s filter) does not release boron.

Note that, Appellant does have a right to disagree. However, Kobayashi clearly teaches: *a filter medium does not release gaseous organic substance* during use.

It is well settled that the presumption of validity attaching to the claims and supporting disclosure of a U.S. patent is substantial, and an appellant carries a heavy burden proving that a U.S. patent is inoperative or non-enabling. See In re Weber, 405 F.2d 1403, 1407, 160 USPQ 549, 553 (CCPA 1969); In re Spence, 261 F.2d 244, 246, 120 USPQ 82, 83 (CCPA 1958); In re Michalek, 162 F.2d 229, 231-32, 74 USPQ 107, 109 (CCPA 1947).

In the present case, Kobayashi specifically claims a filter medium substantially do not release gaseous substance (which is boron) (see claim 1). While the Appellant contends that the filter of Kobayashi does but provides no support for his contention.

Moreover, the presumption of validity and enablement of a patent attaches to unclaimed disclosures as well as claimed subject matter. Amgen, Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1355, 65 USPQ2d 1385, 1416 (Fed. Cir. 2003).

In response to applicant's argument that the **performance** of the filter used in the present application is different from that of Kobayashi.

However, the “performance” are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Art Unit: 2814

Since Kobayashi teaches each and every elements of the claim, thus, the claims are anticipated by Kobayashi.

With respect to the obviousness, since Kobayashi anticipates claim 67, thus, the combination of Kobayashi and AAPA, Mitani and Johnson have rendered all dependent claims obvious.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Anh D. Mai

Conferees:

Olik Chaudhuri, SPE *OC*

Wael Fahmy, SPE *W.F*